

Applicant: ESAB AB
Serial Number: 09/402185
Attorney Docket: 5746
Page 2 of 10

CLAIMS AMENDMENTS

1. (Currently Amended) A friction stir welding method according to which workpieces {2,3} to be welded are positioned on a work-table {7} and by means of clamping means {5,6} device clamped to one another and/or to the work-table and according to which a rotating welding means {12,13} is arranged to move along a joint between the workpieces while being pressed against said workpieces during the welding, wherein additional heat is supplied to the joint prior to and/or during the welding operation, in excess of the frictional heat generated in the joint from the rotation of the welding means and of any other heat that may be supplied to the joint in any other manner by the welding means.

2. (Original) A method as claimed in claim 1, wherein pre-heating the joint to a maximum of 250°C below the fusion temperature of the material of the joint.

3. (Currently Amended) A friction stir welding method according to which workpieces {2,3} to be welded are positioned on a work-table {7} and by means of clamping means {5,6} device clamped to one another and/or to the work-table and according to which a rotating welding means {12,13} is arranged to move along a joint between the workpieces while being pressed against said workpieces during the welding, wherein additional heat is supplied to the joint prior to and/or during the welding operation, in excess of the frictional heat generated in the joint from the rotation of the welding means and of any other heat that may be supplied to the joint in any other manner by the welding means, and the joint is heated by a heating element positioned underneath the joint.

4. (Currently Amended) A method as claimed in claim 1, wherein the joint is supported by a subjacent backing device means {7b} which is preheated to a temperature in excess of 100°C.

5. (Currently Amended) A method as claimed in claim 4, wherein the backing device means is heated to a temperature in the range of 150-250°C.

6. (Currently Amended) A method as claimed in claim 4, wherein the backing device means is heated to a temperature in the range of 500-1000°C.

7. (Currently Amended) A method as claimed in claim 6, wherein the backing device means {7b} is heated by a heating coil {70} built into the backing device means.

Applicant: ESAB AB
Serial Number: 09/402185
Attorney Docket: 5746
Page 3 of 10

8. (Currently Amended) An apparatus $\{1\}$ for friction stir welding, comprising a work-table $\{7\}$ supporting workpieces $\{2,3\}$ to be welded, at least one clamping means $\{5,6\}$ device for clamping the workpieces to one another and/or to the work-table, and a welding means $\{12,13\}$ adapted to be advanced along a joint between the workpieces while being pressed against said workpieces during the welding, wherein and a heating element $\{70\}$ for supply of additional heat to the joint prior to and/or during the welding operation, in excess of the frictional heat generated in the joint from the rotation of the welding means and of any other heat that may be supplied to the joint in any other manner by the welding means.

9. (Currently Amended) An apparatus $\{1\}$ for friction stir welding, comprising a work-table $\{7\}$ supporting workpieces $\{2,3\}$ to be welded, at least one clamping means $\{5,6\}$ device for clamping the workpieces to one another and/or to the work-table, a welding means $\{12,13\}$ adapted to be advanced along a joint between the workpieces while being pressed against said workpieces during the welding and, the apparatus ~~it~~ comprises a heating element positioned underneath the joint wherein a heating element $\{70\}$ for supply of additional heat to the joint prior to and/or during the welding operation, in excess of the frictional heat generated in the joint from the rotation of the welding means and of any other heat that may be supplied to the joint in any other manner by the welding means.

10. (Currently Amended) An apparatus as claimed in claim 8, wherein a backing device means $\{7b\}$ positioned underneath the joint.

11. (Currently Amended) An apparatus as claimed in claim 10, wherein the backing device means $\{7b\}$ is adapted to be heated by the heating element $\{70\}$.

12. (Currently Amended) An apparatus as claimed in claim 11, wherein the heating element is a heating coil $\{70\}$ built into the backing device means $\{7b\}$.

13. (Previously Presented) A method as claimed in claim 3, further comprising the step of pre-heating the joint to a maximum of 250°C below the fusion temperature of the material of the joint.

14. (Currently Amended) A method as claimed in claim 13, wherein the joint is supported by a subjacent backing device means $\{7b\}$ which is preheated to a temperature in excess of 100°C.

Applicant: ESAB AB
Serial Number: 09/402185
Attorney Docket: 5746
Page 4 of 10

15. (Currently Amended) A friction stir welding method according to which workpieces ~~(2,3)~~ to be welded are positioned on a work-table ~~(7)~~ and by means of clamping means ~~(5,6)~~ device clamped to one another and/or to the work-table and according to which a rotating welding means ~~(12, 13)~~ is arranged to move along a joint between the workpieces while being pressed against said workpieces during the welding, wherein additional heat is supplied to the joint prior to and/or during the welding operation, in excess of the frictional heat generated in the joint from the rotation of the welding means and of any other heat that may be supplied to the joint in any other manner by the welding means, and the joint is supported by a subjacent backing device means ~~(7b)~~ which is preheated to a temperature in excess of 100°C.

16. (Currently Amended) A method as claimed in claim 15, wherein the backing device means is heated to a temperature in the range of 150-250°C.

17. (Currently Amended) A method as claimed in claim 15, wherein the backing device means is heated to a temperature in the range of 500-1000°C.

18. (Currently Amended) A method as claimed in claim 15, wherein the backing device means ~~(7b)~~ is heated by a heating coil ~~(70)~~ built into the backing device means.

19. (Currently Amended) An apparatus as claimed in claim 9, wherein a backing device means ~~(7b)~~ positioned underneath the joint.

20. (Currently Amended) An apparatus as claimed in claim 19, wherein the backing device means ~~(7b)~~ is adapted to be heated by the heating element ~~(70)~~.

21. (Currently Amended) An apparatus as claimed in claim 20, wherein the heating element is a heating coil ~~(70)~~ built into the backing device means ~~(7b)~~.

22. (New) A friction stir welding method according to which workpieces to be welded are positioned on a work-table and by means of clamping device clamped to one another and/or to the work-table and according to which the start of the welding operation is initiated by inserting a rotating welding means into a joint and then moving said welding means along the joint between the workpieces while pressing said welding means against said workpieces during the welding, wherein additional heat is supplied to the joint in excess of the frictional heat generated in the joint from the

Applicant: ESAB AB
Serial Number: 09/402185
Attorney Docket: 5746
Page 5 of 10

rotation of the welding means and of any other heat that may be supplied to the joint in any other manner by the welding means and wherein said additional heat is supplied by a heating element capable of supplying heat to the joint prior to and during the welding operation.

23. (New) A method as claimed in claim 22 wherein the joint is pre-heated to a maximum of 250°C below the fusion temperature of the material of the joint.

24. (New) A method as claimed in claim 22 wherein the joint is heated by a heating element positioned underneath the joint.

25. (New) A method as claimed in claim 23 wherein the joint is heated by a heating element positioned underneath the joint.

26. (New) A method as claimed in claim 22 wherein the joint is supported by a subjacent backing device which is preheated to a temperature in excess of 100°C.

27. (New) A method as claimed in claim 26, wherein the backing device is heated to a temperature in the range of 150-250°C.

28. (New) A method as claimed in claim 26, wherein the backing device is heated to a temperature in the range of 500-1000°C.

29. (New) A method as claimed in claim 26, wherein the backing device is heated by a heating coil built into the backing device.

30. (New) A method as claimed in claim 27, wherein the backing device is heated by a heating coil built into the backing device.

31. (New) A method as claimed in claim 28, wherein the backing device is heated by a heating coil built into the backing device.

32. (New) An apparatus for friction stir welding, comprising a work-table supporting workpieces to be welded, at least one clamping device for clamping the workpieces to one another and/or to the work-table, and a welding means adapted to be advanced along a joint between the workpieces while being pressed against said workpieces during the welding, said apparatus further comprising a heating element capable of supplying additional heat to the joint at any time prior to and during the welding operation, in excess of the frictional heat generated in the joint from the

Applicant: ESAB AB
Serial Number: 09/402185
Attorney Docket: 5746
Page 6 of 10

rotation of the welding means and of any other heat that may be supplied to the joint in any other manner by the welding means and wherein the start of the welding operation is considered to be the instant when the welding probe is inserted into the joint.

33. (New) An apparatus as claimed in claim 32 further wherein the heating element is positioned underneath the joint.

34. (New) An apparatus as claimed in claim 32 wherein a backing device is positioned underneath the joint.

35. (New) An apparatus as claimed in claim 32 wherein the backing device is adapted to be heated by the heating element.

36. (New) An apparatus as claimed in claim 35, wherein the heating element is a heating coil built into the backing device.

37. (New) An apparatus as claimed in claim 32 wherein the heating element is adapted to heat the joint to a maximum of 250°C below the fusion temperature of the material of the joint.